

Genetic molecule enables safer method for creating iPS cells

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Researchers at the University of California, San Francisco have designed a safer technique for reprogramming adult cells into a state that resembles embryonic stem cells. This method takes advantage of genetic molecules called microRNAs, which regulate the activity of genes. The original 2007 method for creating reprogrammed cells, called induced pluripotent stem (iPS) cells, relied on inserting four genes, some potentially tumor-causing, into the DNA of an adult cell such as a skin cell. Since then, researchers have whittled the number of genes down to two, and in one case generated iPS cells with only chemicals. However, the process is often inefficient. In this study, the researchers substituted one of the four genes with a microRNA molecule and obtained iPS cells at high efficiency. The researchers suggest microRNAs could replace other genes or improve the efficiency of chemical means of creating iPS cells. In addition, understanding how microRNAs function in reprogramming could lead to new therapeutic strategies for blocking reprogramming in cancer stem cells.

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